

REMOVING THE BLINDFOLDS: EXPOSING SERIOUS UNIDENTIFIED RISKS IN KEY OCCUPATIONS AND TASKS THROUGH FOLLOWBACK STUDIES IN THE BLS ANNUAL SURVEY OF OCCUPATIONAL INJURIES AND ILLNESSES.

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Followback studies have provided essential the in development of effective interventions to prevent traumatic injuries in the United States. The Bureau of Labor Statistics (BLS) Annual Survey of Occupational Injuries and Illnesses provides an exceptional opportunity to conduct such studies and identify hazards and risks that have otherwise remained undetected in present methods of statistical analyses. Other sources and organizations could – potentially – conduct meaningful analyses using similar methods and obtain useful results. However, such analyses have not been forthcoming, at least in the public domain. Thus, the past efforts of the BLS regarding followback studies bear examination for evidence of continued usefulness of the Annual Survey database for followback studies. Furthermore, the suitability of BLS data for more robust analysis is also examined here to determine its potential utility as a source of data not otherwise available.

Past BLS Followback studies

From 1978 to 1989, BLS performed 18 “Work Injury Reports” (WIR). These reports were compiled through BLS “Supplementary Data System” (SDS), in conjunction with selected state workers compensation agencies to identify additional descriptive information and data regarding traumatic and “compensable” injuries bearing special characteristics. The number of states varied among the different studies, but commonly exceeded twenty states. In no case were national estimates possible because of the limited participation of the states. Nonetheless, while national estimate were absent, the large number of cases available through this system allowed BLS to draw a detailed and comprehensive picture of the cases at issue, including characteristics previously unrelated in any statistical setting to the hazards under study.

The value of such detailed analysis was recognized by the National Research Council expert panel convened by BLS in the mid-1980’s. This panel concluded that critical improvements were needed in the nation’s data systems for workplace injuries and illnesses. (1) Among the recommendations from the expert panel was Recommendation #12:

Special studies focusing on specific research topics should be conducted by BLS in conjunction with the Annual Survey, in which OSHA 101’s are collected for the specific injuries or form specific industries, as determined by BLS.

Work Injury Reports and their contribution to prevention

From the standpoint of intervention for injury prevention, and specifically of federal regulatory policy, the most important of these studies was the WIR entitled “Injuries Related to Servicing Equipment.” (2) This

study sought detailed information from employers and workers involved with 1,285 cases combed from 500,000 workers compensation claims filed between August and November, 1980. Of these, a total of 833 workers (65%) responded to BLS' 2-page questionnaire survey regarding the circumstances surrounding their injury.

Two years earlier, on May 17, 1979, the United Automobile, Aerospace and Agricultural Implement Workers (UAW) had filed a petition with the Secretary of Labor under the OSHA Act requesting an Emergency Temporary Standard (ETS) and a final standard on lockout requirements for industrial machinery.⁽³⁾ The UAW submitted with its petition abstracts of 22 fatalities involving lock-out related injuries since 1974.

OSHA responded in September 1979 to the petition by declining to issue an ETS on lock-out hazards, and promising to initiate regulatory action, which it did on June 17, 1980 by issuing an Advance Notice of Proposed Rulemaking requesting various types of information from employers, unions and the public. However, the Secretary of Labor, acting under the regulatory restrictions of the Reagan Administration, took no formal action until issuing a formal proposed standard in 1988. (OSHA in 1983 issued a "preproposal draft of a standard" that OSHA circulated for comment to various stakeholders including employers and trade unions, but no formal public hearings were held on this draft.)

When OSHA issued the final standard on September 1, 1989 (54 Fed.Reg. 36643), it acknowledged the various data sources which underlay its reasoning for adopting the standard. Without question, the most significant single source for this rule was the BLS WIR report. OSHA repeatedly compared the findings of the BLS study to the data available from several other sources:

1. NIOSH's analyses of 59 accident reports,
2. OSHA's analysis of 83 fatality investigations, 1974-80
3. OSHA's analysis of 125 "fixed machinery" fatalities, 1974-76.
4. OSHA's own analysis of 36 lockout-related fatalities from "Fatality/Catastrophe" reports from 1982-83.
5. OSHA's records of 376 "General Duty Clause" citations from 1979 to 1984 involving failure to lockout (10% of all GDC clause citations in that period, most of which presumable involved fatal injuries).

At the 1988 public hearing on the proposed standard, OSHA also evaluated the evidence of a total of 72 fatal injuries related to lockout hazards produced by the UAW.

In sum, the data provided by the BLS 1981 WIR report overwhelmed all the other evidence combined, both for its sheer numbers as well as for the comprehensiveness of its information. No other source came close to BLS' data regarding the very factors which OSHA was bound to consider – and eventually – adopt in its final standard: worker knowledge of lockout hazards, effectiveness of employer training programs, and worker skills in preventing lockout-related injuries.

This robustness was due in major part to the BLS' ability to capture essential information regarding the incidents from the employers and workers involved, which was not possible for many of the fatal injuries absent very detailed and timely investigations. For instance, on four critical aspects of the final standard, only the BLS data consistently supported OSHA's key findings on the necessity of stringent regulation (See Table 2). This is particularly important for determining the role of inadequate worker training, in

which the role of respondent workers is simply irreplaceable in identifying training-related risks and hazards.

The Lockout Standard is clearly one of the most important of all OSHA standards in preventing serious traumatic injuries. In FY 2000, Federal OSHA alone cited employers for 4,149 violations of this standard, the fifth most frequently-cited standard, after Hazard Communication, Scaffolding, Fall Protection and Respiratory Protection. Since 78% of such violations were in manufacturing, Lockout is probably the leading preventive intervention for traumatic injury prevention in the entire manufacturing sector, ahead of standards on electrical safety and personal protective equipment. Much of this would have been impossible had it not been for the availability of BLS' detailed evidence regarding the necessity of various critical provisions of the standard, as well as the overall risk assessment which was facilitated by the BLS data.

The insurance industry is evidently capable of assessing such risks, and was throughout the period of OSHA's consideration of the proposed Lockout standard. Nonetheless, the industry failed to provide such analysis, at least to the public or the Secretary of Labor. It remains for the insurance industry to explain this failing, but such a deficit merely accentuates the necessity of expanding the BLS' own efforts to exploit the availability of the followback study methodology.

Other opportunities afforded by Annual Survey

In their seminal 1998 analysis of BLS Annual Survey Data, Courtney and Webster of the Liberty Mutual Co. have demonstrated the importance of exploring beneath the surface of the BLS' formal reports of the Annual Survey results.(4) They have clearly demonstrated the importance of establishing priorities for additional research using the cross-tabulation capabilities of the BLS analysis. While the focus of their analysis is the revelation of highly "severe" cases associated with fractures, they offer the following conclusion:

The Revised BLS [Annual Survey] method presents one opportunity to increase our understanding of the nature and sources of morbidity in the US workplace, particularly when compared and contrasted to other sources of data on occupational morbidity... an improvement in the utility of the BLS data can be realized by presenting the ... "Days Away From Work" case data in a format with which the occupational health and safety community is already familiar and by presenting the data in a less selected manner.

National statistics on traumatic injury and hours of work

One of the risks and potential hazards about which we face a critical information deficit is the hazard of overwork; specifically, the increased risk from excessive hours of work (as compared to excessive physical loading, or the excessive repetition within a given period of time, both of which pose their own hazards.) With the cooperation of the "confederation of workers compensation insurance boards" (HVGB which excludes public sector and agriculture), Hanecke *et al* examined this question in detail in Germany.(5) Using a universe of 1.2 million cases in 1994, they observed an "exponential" increase in the risk of injury when the hours of work exceeded either 8 or 9 hours. They demonstrated, among other important findings, that the risk of injury increased not only after the 8th or 9th hour of work, but also depending on the time when workers began work.

One limitation noted by the authors was the difficulty of determining “exposure” for the purpose of modeling the risks. In order to create such models, investigators would have to collect broadly data about the work patterns in the exposed workforce.

With assistance from OSHA and NIOSH, BLS is perfectly suited to use its Annual Survey to address both issues. BLS reports that it directly collects “case characteristic” data on over 310,000 cases in the Annual Survey, from over 200,000 employers. This body of cases is on the same order of magnitude as the German data, and should be able to detect the increased risks if they exist. The case-characteristic asks, among other things, the time at which work started, and the time when the incident occurred. Such information allows BLS to determine both the hour at work and the time of day for all such cases.

Likewise, in the new OSHA recordkeeping system and forms, BLS is beginning to collect information on total employee hours at specific worksites. Additional questions regarding work patterns could be addressed to selected employers targeted in a survey on particular types of worker injuries. In addition, the new system requires employers to record for all recordable cases (with or without days away from work) both starting work times and times of incident (see items #12 and 13 on new OSHA 301).

Occupation-based followback study methods

A key group of workers who features prominently in the current Annual Survey are truck drivers. According to the latest Survey, an estimated 141,100 “truck drivers” suffered disabling injuries or illnesses in 1999. They represent the largest single occupational title in the survey, and account for the second highest median period of disability of any single occupation (along with industrial mechanics). By any measure, they are a group at very high risk. While the number of cases (reported by BLS since 1992) has declined from the 1993 peak of 163,800, the decline halted in 1998, with the 7-year average at 148,700 cases. This group, thus, experienced a total of 1,041,000 cases over the 7 years. Using the admittedly inexact median disability of 8 days per case, this represents a total of 8,328,000 days away from work, or about 4,164 working years of disability. Clearly, the human and economic stakes regarding truck driver injuries are extraordinarily and unacceptably high.

The Survey already tells us summary information about the characteristics of truck driver injuries. A compilation prepared by BLS for the years 1992 through 1996 indicates, not surprisingly, that strains and sprains routinely account for about half the cases, with the back as the primary targeted body part. (6) Likewise, overexertion accounts for about one-third of all cases. The disability counts are also important: with employers reporting nearly 40,000 drivers annually suffering more than 31 days lost-time per case.

BLS has also identified serious risks of fatal injuries among drivers.(7) While truck drivers have not had the highest rates of occupational fatalities, they have experienced the highest raw numbers. The vast majority of these are transportation-related, and are poorly addressed by OSHA’s tools for injury prevention. Thus, the primary causes of the drivers’ high rates of non-fatal injury and disability are not to be gleaned from the fatality data.

Thus, unfortunately, these data provide only the most superficial profile of the serious problems facing truck drivers. Given their exemplary position, it is vital that BLS use a follow-back methodology to

determine the importance of other, unrecognized risks faced by truck drivers. The primary trade union of drivers has suggested the following issues (and many more) as worthy of investigation (8):

- Industry Sector (truckload, less-than-truckload, parcel, etc.)
- Length of service with employer and on specific job.
- Compensation system (hourly, mileage, percent of load)
- Hours on the job by day and by week.
- Employer training.
- Quantification of loading/unloading activities

One of the factors which is undoubtedly at issue for truck drivers is the work schedule. As indicated above, the availability of the new work schedule information in the OSHA recordkeeping system will help answer questions about this critical question, not only as it affects truckers but for workers and employers throughout the economy.

The BLS Annual Survey provides a unique method for conducting such studies. No other publicly-owned database can match the BLS' capture of approximately 15,000 truck driver injury cases per year. No other database has the potential to contact the employers or workers involved and obtain from them the vital descriptive information to enlighten us about the true risks of this job. It is vital that this most important source be utilized actively. The same is true for the 25,000 "falls from the same level", and the 60,000 "back" injuries captured annually by the Annual Survey. (9)

A tri-partite discussion of such studies in 1999 elicited widespread support from employer and trade union representatives serving on the Bureau's Research Advisory Committees. Employer representatives, presented with the Bureau's model for such followback studies (10), were enthusiastic. They specifically suggested "slips and falls" as another likely subject of such special studies. Trade unionists concurred.

The national policy dispute over the OSHA Ergonomics Standard has thrust the Annual Survey into the spotlight as never before. The existence of statistically-acceptable estimates from the BLS Survey of a major workplace hazard has revealed important possibilities in the use of such data for urgent interventions. It is incumbent upon all parties, including state and local government representatives, to actively support the development of the capability for such studies within the routine BLS Annual Survey program.

References

1. National Research Council, Committee on National Statistics, *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System*, National Academy Press, Washington, DC, 1987.
2. US Bureau of Labor Statistics, *Injuries Related to Servicing Equipment*, [Bulletin 2115], Washington, DC, October 1981.
3. The petition was also supported by the AFL-CIO, the United Steelworkers of American, and the Allied Industrial Workers (now part of the Paper, Allied, Chemical and Energy Workers/PACE). The events and statistics cited herein regarding the evidence pertaining to OSHA's Lockout Standard are taken from the preamble to OSHA's standard, at 54 FR 36644 – 51.
4. Courtney TK and Webster BS, *Disabling Occupational Morbidity in the United States: An Alternative Way of Seeing the Bureau of Labor Statistics Data*, J. of Occup. and Env. Med., 41:1, 60-69, Jan. 1999.
5. Hanecke, K, *et al*, *Accident risk as a function of hour at work and time of day as determined from accident data and exposure models for the German working population*, Scand. J. Wor. Env. Health., 24 suppl. 3:43-48, 1998.
6. US Bureau of Labor Statistics, *Number of nonfatal occupational injuries and illnesses involving days away from work by selected worker and case characteristics and occupation, all United States, private industry, 1992-1996*,
7. US Bureau of Labor Statistics, *The Unforgiving Road: Trucker Fatalities, Compensation and Working Conditions*, Washington, DC, Winter, 1999.
8. Personal Communication, Scott Madar, Safety and Health Dept., Int'l. Brotherhood of Teamsters, July 6, 1999.
9. Personal Communication, Bill Weber, US Bureau of Labor Statistics, October 23, 2001
10. US Bureau of Labor Statistics, *Occupational Safety and Health Statistics, Epidemiology Studies, Option I, II and III*, Washington, DC, 1999.

Table 1

KEY SOURCES OF CASES FOR OSHA LOCKOUT STANDARD

SOURCE	# CASES	NON-FATAL / FATAL
BLS WIR	833	Non-fatal
OSHA Fatality Investigat'ns I	83	
OSHA Fatality Investigat'ns II	125	Fatal
OSHA "Fat- Cat" reports	36	Fatal
OSHA Gen'l. Duty Clause citations	376	Usually fatal
NIOSH	59	n/a
UAW	72	Fatal

Source: OSHA Final Standard: Control of Hazardous Energy
(Lockout/Tagout), September 1, 1989, 54 FR 36644 ff.

DATA SOURCES FOR KEY PROVISIONS OF OSHA LOCKOUT STANDARD

NUMBER OF CASES FROM SOURCE RELEVANT TO HAZARD

Hazard	BLS WIR	OSHA Fat. Invest. I	OSHA Fat. Invest. II	OSHA “Fat- Cat”	OSHA Gen. Duty Cit’n	NIOSH Fatal. Report
Equip in operation	653	54	23	None	None	27
Failure to isolate power	62	5	None	None	None	6
Inadvertent activation	91	29	31	None	None	25
No employer program	482	None	41	None	None	None
No worker training	340	None	None	None	None	None

Source: OSHA Final Standard: Control of Hazardous Energy
(Lockout/Tagout), September 1, 1989, 54 FR 36644 ff.